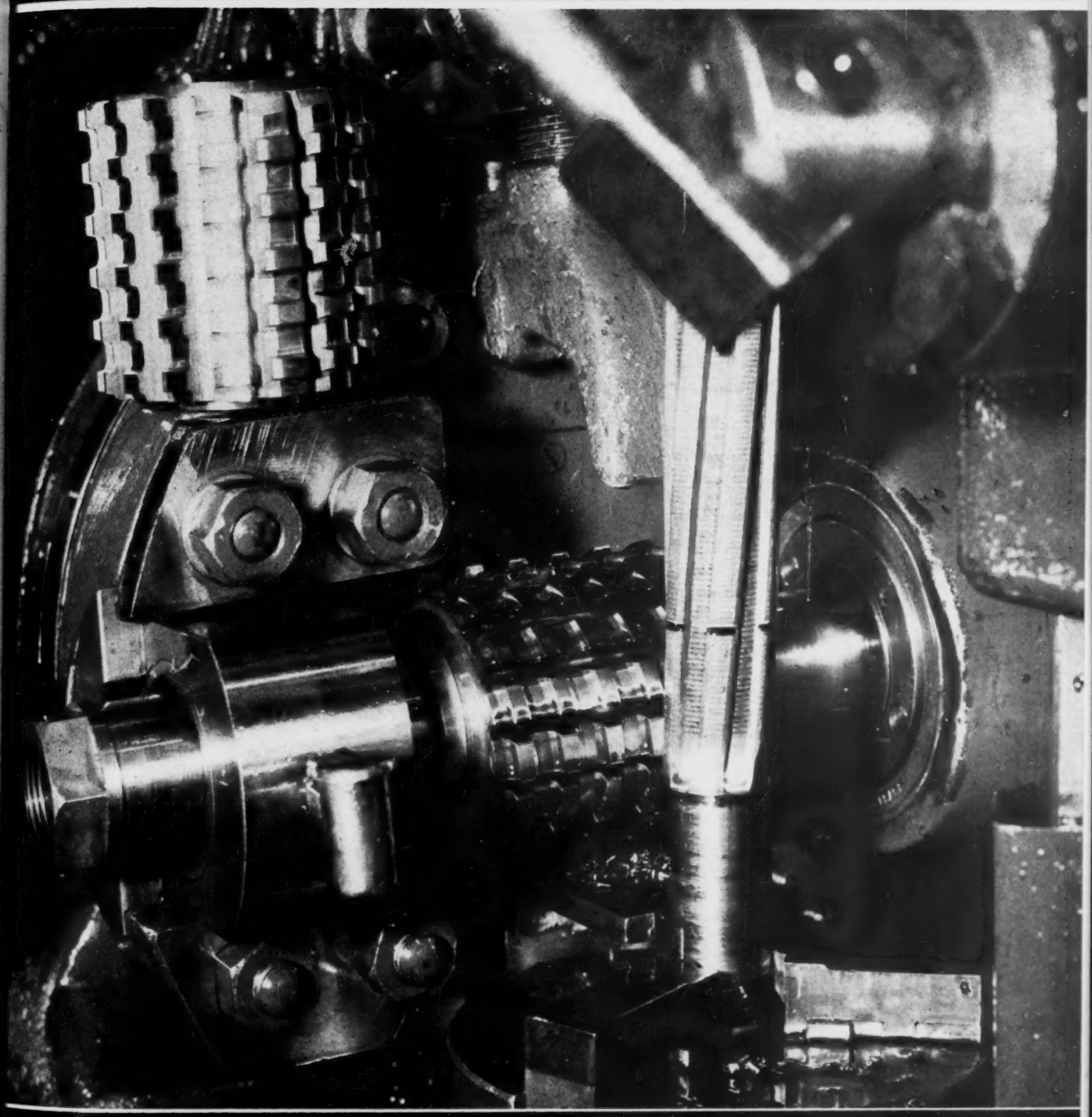
Industrial Standardization

and Commercial Standards Monthly



April

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1940

Economic Significance of Standardization

ON February 23, ten sets of revised gas appliance specifications were approved as new American Standards. This job, the details of which were carried through largely by research and technical men, may seem to have little connection with preparing a company dinner, or with the problem of local trade barriers recently discussed by the Temporary National Economic Commission.

But because of the research and development work that has gone into revising these gas-appliance standards in the past ten years, Mrs. Consumer is now getting one and a half times the cooking efficiency out of her new stove that she did out of the old one, without a corresponding rise in the gas bill. Such economies and convenience make her eager for other appliances. The added consumer acceptance that these standards are bringing to gas appliances is one of the normal results of any thoroughgoing, well publicized standardization program.

And these national standards for gas appliances long ago made local rules and ordinances unnecessary, thus eliminating trade barriers and opening the way for a free national market.

The fact was brought out quite clearly at the Temporary National Economic Commission hearings a few weeks ago that a great many of our so-called trade barriers are nothing more than local standards given the force of law—standards that define a fresh egg as one laid within state boundaries, that require special sizes and weights for motor vehicles on the highways of the state; that set discriminatory specifications for butter, milk, and other food stuffs.

One way to get rid of these barriers has proven to be the development of national standards. Many industries, like the gas appliance manufacturers and operating companies, have made local regulation unnecessary by working through their trade and technical societies and through the American Standards Association in the development of sound effective national standards.

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Industrial Standardization

Combined with Commercial Standards Monthly

Published Monthly by

American Standards Association
29 West 39th Street, New York

with the cooperation of the National Bureau of Standards

RUTH E. MASON, *Editor*

This Issue

Our Front Cover: **Hobbing splindle, with hob in contact with end of cut on an involute spline.** ***Photo courtesy Olds Motor Works Division, General Motors Corp.***

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Standardization is dynamic, not static. It means not to stand still, but to move forward together.

Subscription price $4.00 per year U. S. and Canada (foreign $5.00); Special to schools and libraries $2.00 (foreign $3.00); single copies 35 cents

April, 1940 **Vol. 11, No. 4**

How Standards Eliminate Trade Barriers

The Temporary National Economic Committee devoted the week of March 18 to hearings on trade barriers caused by local legislation and regulations of state and city governments. A great many such trade barriers are local standards given legal force by state or local governments. For example, there are many seriously conflicting requirements as to the size and weight of motor vehicles that are permitted on the highways in many states. There are similar conflicting requirements for agricultural products, such as butter, milk and eggs.

Many national standards developed through the American Standards Association have been effective in eliminating trade barriers, particularly those resulting from legally enforced local standards, P. G. Agnew, ASA secretary, told the TNEC in the course of the hearings. He pointed to the refrigeration safety code, the gas appliance standards, the National Electrical Code, the National Electrical Safety Code, and the work now going forward on bedding and upholstery as examples of how standards can help bring about national acceptance of standard practice.

The session on standards was held March 21, with Representative Hatton W. Sumners of Texas presiding. Representative Sumners is vice-chairman of the TNEC and chairman of the Judiciary Committee of the House of Representatives.

Because of the importance of this trade barrier problem to the industries served by the American Standards Association, we are presenting here the major part of the testimony dealing with the effectiveness of national standards in eliminating and preventing trade barriers.

—Editor

Mr. Donoho[1]. What is the relationship between the work of your Association and trade barrier problems, Dr. Agnew?

Dr. Agnew. We have found in our work that many of the standards that are being developed through the organization have a very direct effect in the elimination of certain types of trade barriers, particularly those types of trade barriers which arise through the use of legally enforced local standards. . . .

Our work in the past twenty years has definitely eliminated a considerable number of State barriers. . . .

I would like to illustrate this work by the work on bedding and upholstery of furniture in which we are now engaged. This problem was brought to us by the organized retailers and in the work the leadership is being taken by the enforcement officials of the various State governments.

The Association was asked to undertake the job because there are now in existence a large number of conflicting regulations among the various State governments. Thirty-seven States have legislation on which regulations are based. There are sixteen of those States that are very active in this enforcement. There are half a dozen States that have legislation and are not enforcing it, and others are enforcing it only indifferently.

We have organized a very representative committee of all of the groups concerned to work upon this problem.

To give you the nature of the problem, there are several types of conflicts between the regulations in the various States. The most important of these consist in differences in the requirements in regard to the materials that go into the product, and also in the requirements of labeling.

For example, the State of New York requires that feathers that have been reconditioned shall be labeled "curled feathers." That is not legal in Pennsylvania, which requires that they shall be labeled "crushed feathers." In New York reworked cloth ticks are called "garneted"; in other States they must be labeled "shoddy." Further-

[1]Haskell Donoho, TNEC counsel.

more, there are important differences in the administration of these laws and regulations, so that often double inspection is required, and it has actually happened in many cases that, even when the regulations are the same, one administration rules the matter prohibited and other States permit it, even though the wording of the regulation is the same.

The California Law

A striking illustration of this is in the State of California where the administration of the law is so different that a pillow which is made of downs and feathers, 90 per cent down and 10 per cent feathers, if it is made in the State of California may be labeled "pure down." If it is made outside of the State and imported into the State, it must be labeled "90 per cent down," although the materials are identical.

Furthermore, there are very annoying differences in the form of label required, differences in the statements on the label, differences in the color of the label required, differences in the size.

MR. DONOHO. Are differences like that very important? They seem rather small.

DR. AGNEW. They are small, but sometimes small things, like a microbe, may cause considerable trouble, and these require virtually the preparation of the material specially for the destination of the product.

MR. DONOHO. Just what is your Association doing about this sort of thing?

DR. AGNEW. Under the leadership of the State officials that are charged with this duty, they have an association called the National Association of Bedding and Upholstery Law Enforcement Officials, we are developing——

THE VICE CHAIRMAN (Interposing). Let's get that. You say the States have an association of their officers whose business it is to enforce the law with regard to bedding?

DR. AGNEW. That is right, sir.

THE VICE CHAIRMAN. That is distinguished from the association of the States, as it functions, I believe, mainly through the office of the chief executives of the States?

DR. AGNEW. Yes, Mr. Chairman. There is a considerable group of organizations of State officials.

THE VICE CHAIRMAN. That is right, the chief of police, sheriffs——

DR. AGNEW (Interposing). Public utility commissioners. There are at least seven or eight of such national organizations of State officials that are cooperating in this work.

THE VICE CHAIRMAN. I just wanted to put that in the record. Thank you.

Affiliated Organizations

DR. AGNEW. In this case, Mr. J. Davis Donovan of Maryland is the president of that Association and he is the chairman of our committee. It is a rather long list but to show you how this work is carried out, I would like to read the list of the different national organizations that are participating in this work. Each of them is concerned with some angle:

National Association of Bedding and Upholstery Law Enforcement Officials, American Association of University Women, American Cotton Waste Exchange, American Home Economics Association, American Hospital Association, Associates for Government Service, Bedding Manufacturers Board of Trade, Inc., General Federation

Testing Gas Stoves in 1930

Nationally acceptable approval requirements and standard tests have helped develop a better product and removed trade barriers

of Women's Clubs, Maryland and District of Columbia Bedding Board of Trade, National Association of Bedding Manufacturers, National Association of Curled Hair Manufacturers, National Association of Furniture Manufacturers, Inc., National Bedding and Upholstery Manufacturers Board of Trade, National Bureau of Standards, National Retail Dry Goods Association, New England Bedding Manufacturers Association, New York State Department of Labor—Bedding Division Supply Men's Club, U. S. Department of Agriculture: Consumer's Counsel, AAA; and Bureau of Home Economics.

The VICE CHAIRMAN. In those various groups do you have very different general basic interests or are they groups that have the same interests basically?

DR. AGNEW. There are groups there that have quite different interests. The manufacturers' interest in many respects is quite different from the retailers' interest, and in many respects the consumers groups' interests are different. Again the institutional buyers of such products have different interests.

The VICE CHAIRMAN. I don't mean to take up too much time, but what is the difference between their interests and the interests of the ordinary housewife?

DR. AGNEW. Well, it is closely allied to the interests of the ordinary housewife.

This committee is made up of representatives of these various organizations. Three standards for the different materials that go into this already have been developed, other standards for inner springs, feathers and downs, and quite important methods of testing whether seconds or used material is properly sterilized and whether it is new material or is reworked material.

The VICE CHAIRMAN. I think the committee gets that point of the picture. Is there an agency of inspection and supervision or does the individual buyer have to determine for himself?

DR. AGNEW. In this case the various State laws and the regulations require a label revealing the fact or certifying that it has been properly sterilized, and also to prevent fraud in misrepresentation of the contents. You can't tell by looking at a mattress or a pillow what is on the inside, and these labels prevent fraud as well as make for the protection of the health of the public.

The VICE CHAIRMAN. I get that. How do you go about having an agency of inspection and supervision whose efficiency and authority would be generally recognized in interstate commerce?

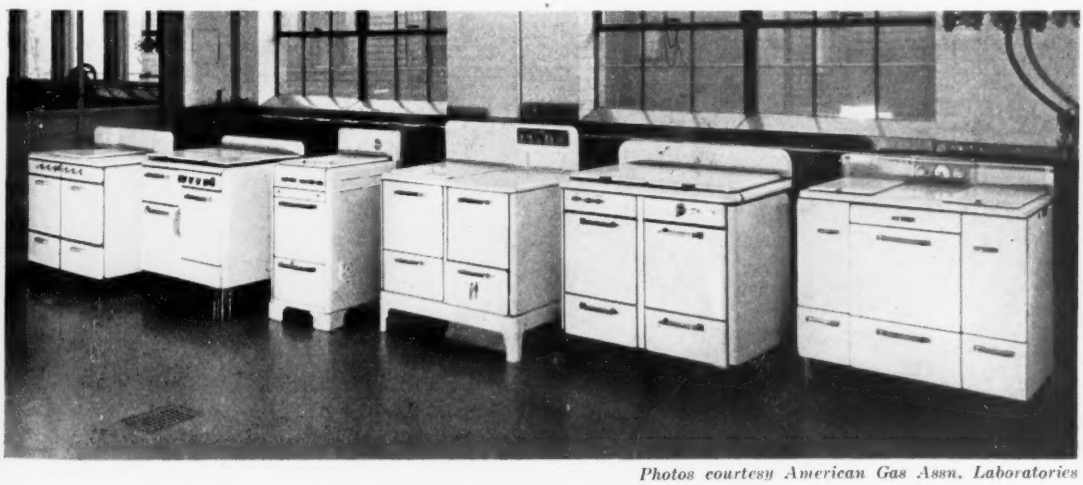
DR. AGNEW. This scheme depends wholly on the cooperation between the different States through this national organization of the officials. Fortunately the manufacturers have cooperated very closely with it.

Interstate Compacts

The VICE CHAIRMAN. What I am trying to get at is how do these groups agree upon who is to do the inspecting, or do you contemplate an arrangement where there will be a compact among the States which will accept each other's inspections?

DR. AGNEW. That is right. That is exactly what the association of officials is planning, and certain steps have already been made between certain States, but that is not yet general, and the general arrangement with a coordinated system of inspection will have to await completion of all of the standards in this field.

The VICE CHAIRMAN. With respect to these



Photos courtesy American Gas Assn. Laboratories

Gas Stoves of 1940

Improvement in design is matched by improvement in efficiency. 50 per cent greater heating efficiency is the record for gas stoves in ten years

springs that you speak of, does that require a very large and expensive rearrangement of machinery for manufacturing?

DR. AGNEW. No, Mr. Chairman, the type of standardization work that we do does not attempt to stop manufacturers from doing anything. It is just to reveal what the product is.

The VICE CHAIRMAN. I have, if I may speak for myself, given some consideration to what I think are the possibilities of standardization. As I see it, if you can by standardization be able to describe a commodity by a well recognized trade term, then you would make it possible to put that commodity, whether produced by a little manufacturer or a big manufacturer, in contact with the general market while it probably is at the point of origination.

If instead of having to ship your mattress, for instance, around over the country to have it inspected, you could sell it by its descriptive trade name and there were an agency of inspection and supervision which would make the person buying it by its descriptive trade name feel confident that it would be delivered according to that description, there would be (and some day I hope there may be) an intermediary agency that would give selling confidence that there would be receipt and payment accordingly.

The Small Producer

But if you gentlemen who are interested in standardization could work out systems of standardization with regard to commodities which are in general demand, both as to raw material, possibly, and as to finished commodities, it would seem that you probably would make it possible for the small producer of a standardized raw material to list his commodity on some marketplace comparable to an exchange, and if it could be done, then he could establish trade contact with the general market, however small the producer is.

On the other hand, the small manufacturer, it seems to me, could produce a commodity that would meet, for instance, your standard requirements (for instance, in mattresses) and there should be some place where it would be made possible for the person who wants to buy that mattress to get in trade contact with the person who has produced it, whereby it seems to me that that would go far toward bridging the distance between production and consumption and go far toward creating the possibility of the small man not big enough to have an individual selling organization to bridge the distance between himself and the general market. . . . Is that crazy stuff or is that somewhere in the realm of reasonableness?

DR. AGNEW. Mr. Chairman, far from being crazy, that is in many commodities a realized fact today. It is a realized fact in a considerable number of commodity specifications, but mostly in the industrial field rather than in the consumer goods field. Our whole organization was set up to eliminate conflicting standards, because at that time there were several hundred organizations in the country issuing standards. It was set up primarily for standards for those products which one corporation buys of another, but a few years ago some of the consumer organizations came to us and asked us to enter into the field of consumer goods.

We have done so, and that work as yet is very small compared with the work that we have done in the other field—a dozen specifications in the consumer goods field against 400 standards that have been issued and approved in the field of industrial goods.

The VICE CHAIRMAN. I wish you people would kind of keep working on that thing. . . . I am certain that many commodities are susceptible of being sufficiently described by a trade term that the buyer and seller can have the same picture of what that thing is.

Where it is not possible for these buyers and sellers to get together, it would be possible, it seems to me, to establish an intermediary agency of inspection, supervision and labeling so that entire strangers would have confidence in trade with each other in the commodity which the buyer had never seen, purchasing from a producer or seller whom he had never seen and whose integrity was of no concern to him. If we could do that, it seems to me we would be moving pretty far toward establishing a sort of democracy in business opportunity.

The IES Lamp

DR. AGNEW. May I illustrate a fine example of just what you have outlined, Mr. Chairman? That is a realized fact. It is not an accomplishment of our organization. I wish I could say it were. That is what is known as the IES Lamp. Those letters stand for Illuminating Engineering Society, which developed specifications for a lamp for the household that would give really good lighting, adequate lighting, would be flexible and which would not be injurious to the eyesight, in other words a real illuminating engineering job. This lamp was developed and put on the market by any manufacturer that wanted to meet those specifications, and a great many of them were made, and actually, for the first few months they could not keep up with the orders, the lamp was so popular. The output is controlled by a well developed system of test inspection, and it is one of the notable recent new developments in merchandising.

The VICE CHAIRMAN. Well, sir, it is worth your

whole trip down here and almost worth half of this examination to have somebody really give some testimony like that. It seems to me a most important thing. You can readily see that one of the big difficulties that confronts modern society in trying to preserve a democracy of opportunity is the fact that with the application of steam, electricity, and gasoline to our activities, the field of production and the field of consumption have moved so far apart that a small organization can't bridge the distance, can't maintain trade contact.

In the days of the manorial markets when the individual was the industrial unit, the community in the main the industrial organization, the old manorial markets which were under Government control afforded the opportunity for everybody to bring his commodity in and really get in contact with the general market. Now we have had no substitute for that, no way for the person who has a commodity for sale, a relatively small producer, to let the persons who want to buy his commodity know that he has a commodity; he can't ship it all over the country, but if he could ship the descriptive trade name, if there were some place more or less on the hilltops of commerce where he could list the commodity for sale and to which prospective buyers could resort, even by telegram, then you would seem to me to have made a great step.

I am trying to get this across to you because you are in a key position. . . . Say, up there at the headwaters of the Potomac there are buyers on one side of that river and sellers on the other, the difficulty in getting across is not so great, but when the thing moves down here to this broad river if there were no public bridges, it would be only a tremendously big farmer, for instance, on the other side who could build a bridge of his own to span the river and the little fellow couldn't get across. What he would have to do would be to sell to somebody to bring his stuff across. We should have somebody to take that place, and you people can do it, and it can't be done, as I see it, unless you do the job.

Achievements of Association

DR. AGNEW. Your remarks are very encouraging, Mr. Chairman. You have outlined in admirable form the main objectives of the American Standards Association. I think that it is remarkable that so small an organization has been able to attract the cooperation of so many large groups. All of the 400-odd standards that we have developed have a very definite influence toward a free national market. You spoke of definitions of terms. Even a very technical specification, Mr. Chairman, like the specification for cement, after all is but a definition so that a buyer can send a telegram even, as you say, "Send me a thousand barrels according to Specification No. 37," and that is the definition of what the buyer and seller mean and they are speaking the same language. . . .

I should like to mention a few other examples of this type of work. We have developed a safety code for refrigeration, for the protection of the public against the hazards of this new art. When that code was developed we had a very rough time of it. In my opinion, very unfortunately certain of the commercial groups made contact with the municipalities to influence ordinances, to affect the materials one way or the other.

MR. PIKE. Those are the refrigerants?

Standard Helped Refrigeration Market

DR. AGNEW. That is right. We have taken that standard through three stages, and it has gone a very long way in cleaning up those barriers in the form of city ordinances, and has made a pretty clear national market. Now this has gone hand-in-hand with the research and standardization work on the subject, and as a result, over this period of years the product has improved very definitely and the price has dropped. It is a fine illustration of that freeing of a national market, an improvement of product, with protection of the consuming public, by an organized attack on fundamental problems.

I mentioned safety codes. We have a group of more than fifty codes—a code for grinding wheels, a safety code for elevators, for punch presses, an electrical code, and so on. The purpose of these codes is for the protection of employees in industry and for the protection of the public. The program was started originally at the instance of the manufacturers who were annoyed by conflicting State regulations. For example, an electric motor for a particular use in order to be legally safe in Pennsylvania had to be legally unsafe in the State of Wisconsin, and similarly, the Wisconsin motor was legally unsafe in the State of Pennsylvania.

There are three methods of guarding gears so that the workman doesn't get his fingers destroyed. One group of States required one of those methods, another group of states required another method, and a third group required a third group of standards. A thoroughly organized committee went at it and brought out a code which allowed in the proper place all of these three types.

MR. PIKE. All three were satisfactory?

Varied Interests Represented

DR. AGNEW. For particular situations. Each was allowed wherever the situation was applicable, of course. The same thing in punch presses

—different requirements in the different States. Each of these committees that work on, say, the refrigeration code or the elevator code, and so on, is made up of individuals that represent all the interests involved, and this has brought about a fundamental integration as between the different States and the requirements as between employers and labor for the protection of the workmen.

Insurance companies used to have different regulations; they are now using these national codes. In fact, in much of this work there is a really integrating factor going on as between the Federal Government and the State governments, and in other cases the municipal governments.

MR. PIKE. That means almost in each case that somebody has to give up his pet idea in order to fit in with the others?

Fundamentals Bring Rivals Together

DR. AGNEW. That is right. It is remarkable, though, how, after they have worked together, a committee of men like that, sometimes bitter rivals at the start, really get interested in the fundamentals.

MR. PIKE. The old example we used to get on the border; on one side you drove on the left, on the other side on the right, and either one was perfectly sound, but if you got on the other side you were in trouble.

DR. AGNEW. Your illustration reminds me of a few other jobs that this organization has tackled. Fifteen years ago you stopped your car on Fifth Avenue in New York City on green, you started it on yellow, and red meant caution. It was a different system in Cleveland, a different system in Chicago, a different system in Buffalo, and so on. The Association of Police Chiefs asked us to take up that problem, and there were many different ideas, but there came out of it a unified code which is now in universal use in this country; it is in extensive use in Europe and is being introduced regularly in each of the other continents.

The VICE CHAIRMAN. You made a very interesting statement. When people get together and do together a thing, they learn by doing that thing how to get together and do other things.

Gas Standards Solve Industry Problems

DR. AGNEW. That has happened many times in our committees. May I illustrate that by another code? In the gas-burning appliances, originally that committee was gotten together to develop a minimum code for gas safety. There were battles in that committee that lasted a half dozen years. They learned to work together and they solved the problem, and under the leadership of the gas industry itself, but with the cooperation of every other group that had a substantial concern with the problem, they have developed specifications, standards, for 27 different types of gas burning appliances and accessories, which includes all of the types of apparatus that you find in a well equipped home.

There was a tendency years ago for city barriers to grow up. There were different kinds of ordinances passed in about fifty cities, but this group of standards, worked out on a voluntary basis, has pretty well worked out that situation and there is a pretty free national market unencumbered by local restrictions.

A very interesting part of this is that it had to be founded on a great deal of research and testing work, which was headed up in the gas industry itself, and as a result, in the last ten years there have been more improvements in gas-burning appliances than had taken place in the forty years previously.

Promote Efficient Operation

In that ten-year period the thermal efficiency of the top burners of the gas range has increased by fifty per cent. That means that today in the modern stove you can heat three quarts of water with the same amount of gas that ten years ago was required to heat two quarts. Similarly, the efficiency of the gas-fired hot water heater has increased 25 per cent in that same ten-year period. That improvement has gone forward coordinately with this standardization work, not alone from standardization work, but coupled with research and standardization.

The VICE CHAIRMAN. Let me ask you, Doctor, in your experience of trying to bring about the abolition of trade barriers, is it recognized generally that these trade barriers are not economic and that the pressure of a general recognition as it comes to be understood tends in itself to break down these barriers?

DR. AGNEW. I would say that the groups I am working with would agree with the expression that you have just made. . . .

Mr. Chairman, in connection with the Chairman's last remark I would like to add two things: First, that in the electrical development their market has been kept pretty fairly free by a series of codes, notably the National Electrical Safety Code under the leadership of the National Bureau of Standards, and the National Electrical Code on the wiring of buildings under the leadership of the National Fire Protection Association.

In connection with the words of the Chairman a moment ago, it seems to me that this voluntary method of national standards has an enormous role to play in the removal of certain types of local standards, particularly those which depend on local standards. It seems to me that it should

be definitely the obligation of the Government administrator, Federal or State or local, before he issues and puts the police power of the law behind a local standard, to investigate the subject and find out whether there are national standards that are workable and that will apply; and second, it seems to me that it should be the moral obligation of the industrial leadership to see that such national standards are developed where there is a need for them.

New Foreign Standards Available from ASA

The following new and revised foreign standards received by the American Standards Association since the last issue of Industrial Standardization may be borrowed or ordered by ASA members. When ordering copies please refer to the number as well as the title. The standards are published in the language of the country from which they were received.

Great Britain

Natural aggregates up to 1½ in. nominal maximum size for concrete for structural purposes including roads (882-1940)

Seamless brass tubes for general purposes (885-1940; 886-1940)

Hard-drawn seamless brass tubes (885)

Annealed seamless brass tubes (886)

Vernier callipers (887-1940)

Slip (or block) gauges and their accessories (888-1940)

Revised

Thermometers for general purposes laboratory (593-1940)

Petri dishes (611-1940)

Asbestos-cement slates and unreinforced flat sheets and corrugated sheets (690-1940)

Rubber gloves for electrical purposes (697-1940)

Trailing cables for mining purposes (708-1940)

British Air Raid Precautions Standards

Testing incombustible material resistant to incendiary bombs (BS/ARP 27)

Testing fire-retardent timber treatment by exposure to the action of an incendiary bomb (BS/ARP 39)

Revised British Air Raid Precautions Standards

Light-locks at entrances to buildings (First revision of BS/ARP 15)

New Zealand

Asbestos Cement Unreinforced Flat Sheets and Corrugated Sheets (282)

Dimensions and Workmanship of Asbestos Cement Spigot and Socket, Rainwater Pipes, Gutters, Spoutings and Fittings (284)

Standard Code of Building By-Laws Parts I-VI (Revision of Sections I, II, III, V, VI, VIII, and X) (95)

Methods for the Testing of Concrete (192)

Italy

Definitions of sides and numbering of parts in aircraft (UNI 0303)

Nickel steel, case hardening and forging (760-761)

Nickel steel, quenching and tempering (762-763)

Voltages for aircraft installations (764)

Identification of ignition cables and of their connections in aircraft engines (764-766)

Fixing and frontal flanges of magnetos in aircraft engines (768)

Panels of plywood for aircraft constructions (769-771)

Naval stud link cables (781-794)

Naval cleats (795-800)

Proposed Changes in Can Size List Before Industry for Acceptance

At the request of the National Canners Association, the Division of Simplified Practice, National Bureau of Standards, has submitted to the industry for acceptance another revised list of recommended standard sizes for fruit and vegetable cans.

This current revision is a modification of the revised list mailed out to the industry for acceptance, in July, 1939. While sufficient acceptances were received to warrant the promulgation of the July, 1939, list, suggestions were made for strengthening it, the Division of Simplified Practice explains, and the suggestions, together with the industry's experience with the 1939 pack, indicated the desirability of amending the list to increase its usefulness for next season's pack.

The recommended number of can sizes varies for the different fruits and vegetables, ranging from two for baby foods and three for apples and rhubarb up to 10 for asparagus tips and cuts and 12 for tomato juice.

Copies of the proposed revision of Simplified Practice Recommendation R155-37, Cans for Fruits and Vegetables, may be obtained from the Division of Simplified Practice, National Bureau of Standards, Washington, D. C.

Ask Comments on Foreign Drafts

Two draft standards from foreign national standardizing bodies were received by the American Standards Association during the past month, with request for comments. The date following each title is the closing date for receipt of comments by the British and Italian associations:

Great Britain

Draft British Standard Code of Practice for the Glazing and Fixing of Glass CF (B) 5240 (Comments before June 7, 1940)

Italy

Standardization of Iron Fittings for Naval Purposes (0297) (Comments before May 15, 1940)

Copies of these draft standards may be borrowed from the American Standards Association. The ASA will be glad to forward comments to the British and Italian associations.

New Material Is Offered in Draft Standard for Electrical Symbols

ASA Committee Asks Criticism

LETTER symbols for 79 electric and magnetic quantities, as well as names and abbreviations for 44 electrical units, to help editors, engineers, and scientists in expressing these quantities uniformly, are contained in a draft standard which is now being circulated for trial and criticism. The original standard, which was approved by the American Standards Association in 1928, gave symbols for 50 quantities and did not include the abbreviations, or the statement of general principles governing the use of the symbols which is included in this draft for the first time, or the name of the unit or the defining equations.

The new edition of the standard is being prepared by a sectional committee of the American Standards Association, sponsored by the American Institute of Electrical Engineers, the American Association for the Advancement of Science, the American Society of Civil Engineers, the American Society of Mechanical Engineers, and the American Society for the Promotion of Engineering Education.

"Letter symbols," the report explains, "are letters used to represent magnitudes of physical quantities in equations and mathematical formulas."

It continues with an explanation that they are not abbreviations, mathematical signs and operators, or graphical symbols, and defines these as:

Abbreviations are shortened forms of names or expressions employed in texts and tabulations, and should not be used in equations.

Mathematical signs and operators are characters used with letter symbols to denote mathematical operations to be performed.

Graphical symbols are conventionalized diagrams or letters used on plans of drawings.

Comments or suggestions on the "Report on Proposed Revision of American Standard for Letter Symbols for Electric and Magnetic Quantities" are invited. They should be sent to H. E. Farrer, secretary of the Standards Committee, American Institute of Electrical Engineers, 33 West 39 Street, New York.

Copies of the draft are available from the American Standards Association.

Board of Examination Appointed for 1940

Members of the Board of Examination have been appointed by Dr. R. P. Anderson, chairman of the ASA Standards Council, to serve for the balance of the year 1940, as follows:

W. C. Wagner, Philadelphia Electric Company, representing the ASA Electric Light and Power Group, *Chairman*
Colonel John K. Clement, New York Ordnance District, War Department
R. B. Shepard, Underwriters Laboratories, Inc., representing the Fire Protection Group
T. E. Veltfort, secretary, Copper and Brass Mill Products Association
Harold P. Westman, secretary, Institute of Radio Engineers

The Board of Examination is a standing judicial committee, advisory to the Standards Council on all non-controversial matters concerned with ASA procedure which do not come under the jurisdiction of the ASA correlating committees. The correlating committees, which act as advisory committees to the Standards Council within their respective fields, are: the Advisory Committee on Ultimate Consumer Goods; the Building Code Correlating Committee; Electrical Standards Committee; Highway Traffic Standards Committee; Mechanical Standards Committee; Mining Standardization Correlating Committee; and the Safety Code Correlating Committee.

Conference on Weights To Meet June 4-7

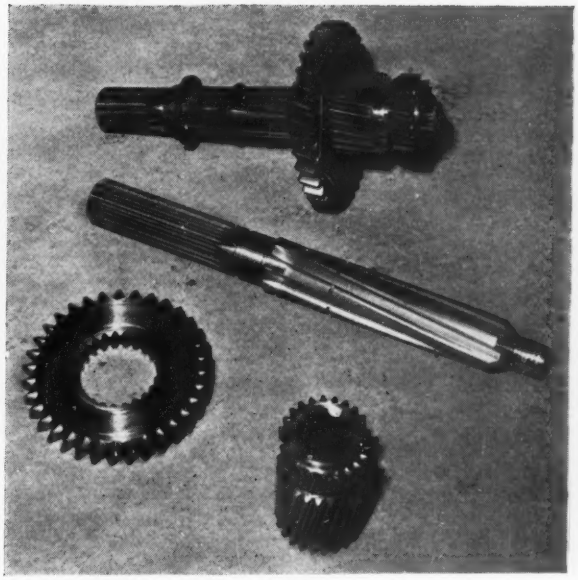
The thirtieth meeting of the National Conference on Weights and Measures will be held in Washington, D. C., June 4, 5, 6, and 7. The opening session will be held at the National Bureau of Standards; other sessions at the Bureau and at the Mayflower Hotel.

Weights and measures officials, equipment manufacturers and distributors, and all others interested are invited to attend.

Dr. Lyman J. Briggs, Director of the National Bureau of Standards, is president of the conference; and Ralph W. Smith, also of the Bureau, is acting secretary.

Several applications of involute splines on an automobile transmission main shaft.

The shaft in the assembly has a 16-tooth side-bearing involute spline for permanent fit immediately to the left of the thrust collar. The spline on the end of the unassembled shaft is also a 16-tooth spline but for sliding fit; it is cut by the same hob as the first shaft, sunk slightly deeper. An 06 ball bearing is slipped over both these splines in the transmission assemblies. Other applications of splines and gear teeth serving as splines may also be seen—the external teeth are produced by hobs and the internal teeth, by broaches.



Involute Spline Standard Meets Widespread Demand

by
C. H. Stanard[1]
and
C. K. Lenning[2]

IN line with a constantly growing practice among certain manufacturers of making spline fittings with involute rather than straight-sided teeth, and to meet an increasingly widespread demand for a standard basis for involute spline proportions together with consequent standardization of tools, the Involute Spline standards were prepared by a representative committee, organized under the procedure of the American Standards Association and approved by the ASA in November, 1939. These standards provide:—

1. Spline tooth profiles accurately producible in any quantity at moderate cost.
2. Shaft fittings with high values of section modulus and moment of inertia.
3. Individual internal or external fittings geometrically similar to any other of like number of teeth and gradation of depth.
4. A very small stock of hobs for producing the entire list of shaft splines, minor modification only being necessary for specific cases.
5. Use of the implied series of standard tools may be extended to produce well proportioned splines beyond the Standard list.
6. Tools most of which are also usable for manufacturing an infinite number of well proportioned helical splines.
7. Diameters directly related to commercial bearing bore sizes.

The tables of the Standard cover 6, 10, 16, 24, and 36 tooth splines.

For inherent symmetry and ease of measurement all splines are shown with even numbers of teeth.

Six, 10, and 16 splines were chosen to permit replacement of corresponding SAE splines with minimum disturbance of design.

For high torque capacities with relatively shallow teeth (as for splined hollow shafts or thin hubs) 24 and 36 tooth splines were added. These fine-toothed spline numbers were made multiples

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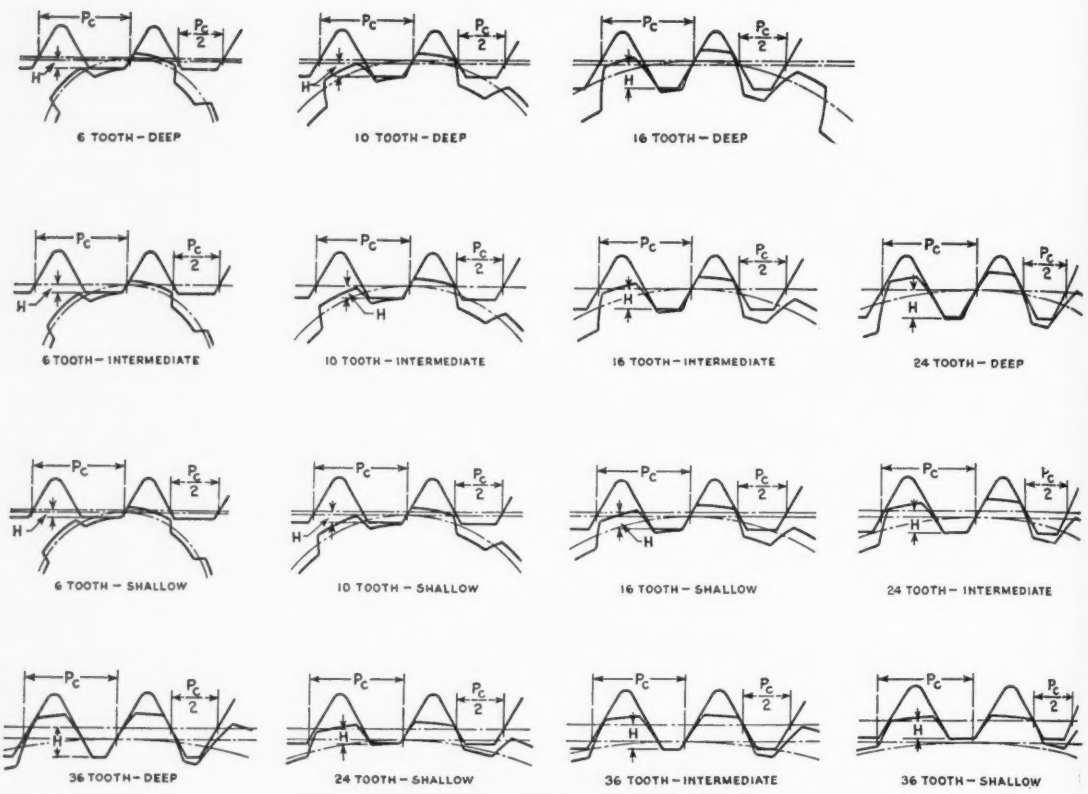
[1]Buick Motor Car Company.

[2]Olds Motor Works; Chairman of the Special Subgroup on Involute Splines, of Technical Committee No. 13 on Standardization of Splines and Splined Shafts; Sectional Committee on Small Tools and Machine Tool Elements (B5).


6 TOOTH – DEEP
10 TOOTH – DEEP
16 TOOTH – DEEP
6 TOOTH – INTERMEDIATE
10 TOOTH – INTERMEDIATE
16 TOOTH – INTERMEDIATE
24 TOOTH – DEEP
6 TOOTH – SHALLOW
10 TOOTH – SHALLOW
16 TOOTH – SHALLOW
24 TOOTH – INTERMEDIATE
36 TOOTH – DEEP
24 TOOTH – SHALLOW
36 TOOTH – INTERMEDIATE
36 TOOTH – SHALLOW

Interrelations of Hobs and Splines
(Reproduced from American Standard)

of 6 rather than of 10 or 16 because of the occasional design advantage of divisibility by three.

Following SAE practice, splines of any given diameter or tooth pitch are classifiable as of Deep, Intermediate, or Shallow engagement.

Shaft sizes range from .787 in. to 4.331 in. inclusive (20 mm to 110 mm).

All involutes are derived from 30-degree racks.

The Tables of Dimension include the following data:—

1. The bearing bore to which the major diameter of the shaft spline bore is nominally equal.
2. Pitch Diameter as a reference for specification of pressure angle and lineal pitch of generating tools.
3. The base circle for reference for calculations.
4. The major diameter as "Root Diameter" for Internal Splines and "Outside Diameter," for External splines, suitable tolerances being incorporated.
5. Minor diameters ("Inside" for Fittings; "Root" for Shafts) with embodied tolerances.
6. The circular width of space at the pitch line. The thickness of shaft and fitting teeth are equal at half their engaging depth.

The Appendix includes Tables 1 and 2, Over-Pin Measurements of External Splines (which may also be utilized in checking broaches). The pins are tangent at practically half the depth of engagement between the shaft spline and its standard fitting.

The figure shown above is reproduced from the standards and shows comprehensively the relations with the basic racks. The pitch line of the rack (or pitch diameter of the hob) is considered as that line at which the tooth thickness and tooth space are equal. It will be noted that in the cases of the 6, 10, and 16-tooth Deep splines, the hob is sunk below the pitch diameter of the work. In the cases of the 6, 10, and 16-tooth Intermediates and the 24-tooth Deep splines, the lines of the cutting tool and work are tangent. In the case of the 6, 10, and 16-tooth Shallows and the 24-tooth Intermediate, the pitch diameter of the hob is a moderate amount above the pitch diameter of the work. In the case of the 36-tooth Deep, the 24-tooth Shallow and the 36-tooth Intermediate, the gap between the rack pitch line and work pitch diameter is increased further. No physical portion of the cutting tool crosses the pitch circle of the 36-tooth shallow spline.

In Table 3 are tabulated all hobs required by the Standards. The following pages give dimen-

sions for the tooth-form of hobs, the value *H* being the only vital difference between hobs of a given pitch. The value *K* is the amount to be removed from the deepest cutting hob of a given pitch to yield the proper value of *H* for any specific spline.

For cutting the shaft splines, the dimensions shown are applicable to racks, as well as hobs, and also to shaper cutters, except that in the case of any tool based on a finite number of teeth, the variation of the pressure angle with diameter must be considered.

For cutting internal splines, shaper cutters may be used in most cases, as well as broaches; the tooth dimensions for them may be found in the main body of the standard. Attention is again invited to the fact that the cutter pitch circle must be tangent to that of the work to obtain the desired pressure angle.

In addition to the advantages suggested in the first paragraphs of this article, the adoption of involute rather than straight-side form greatly facilitates the fitting of mating members as the precision of fit is entirely controllable by the depth to which the hob is sunk in the external spline, once the internally splined piece has been produced.

Diameter of the work need not be considered in the case of the straight-side hobs or other involute-generating tools employed. Practically all refinements for producing and measuring involute gear teeth developed in recent years may be employed in the manufacture of involute splines, insuring a degree of evenness of spacing, control of run-out, and accuracy of flank contour unknown in any other form produced in quantity.

Our Front Cover

This picture shows a hobbing spindle, with an involute spline in process of being cut. The hob is shown in contact with the work at the end of the cut.

This photograph, and the one on page 89 are used through the courtesy of the Olds Motor Works Division, General Motors Corporation.

ASTM Indexes Standards And Tentative Standards

A subject and numerical list of all of the 885 standards and tentative standards of the American Society for Testing Materials, as of January 1, 1940, is made available in the *Index to ASTM Standards, Including Tentative Standards,* just published. All items are listed in the Index under appropriate key-words according to the subjects they cover. A list of the specifications and tests in numerical sequence, by serial designations, is also given.

Copies of the 152-page Index are available without charge from the American Society for Testing Materials, 260 S. Broad Street, Philadelphia, Pa.

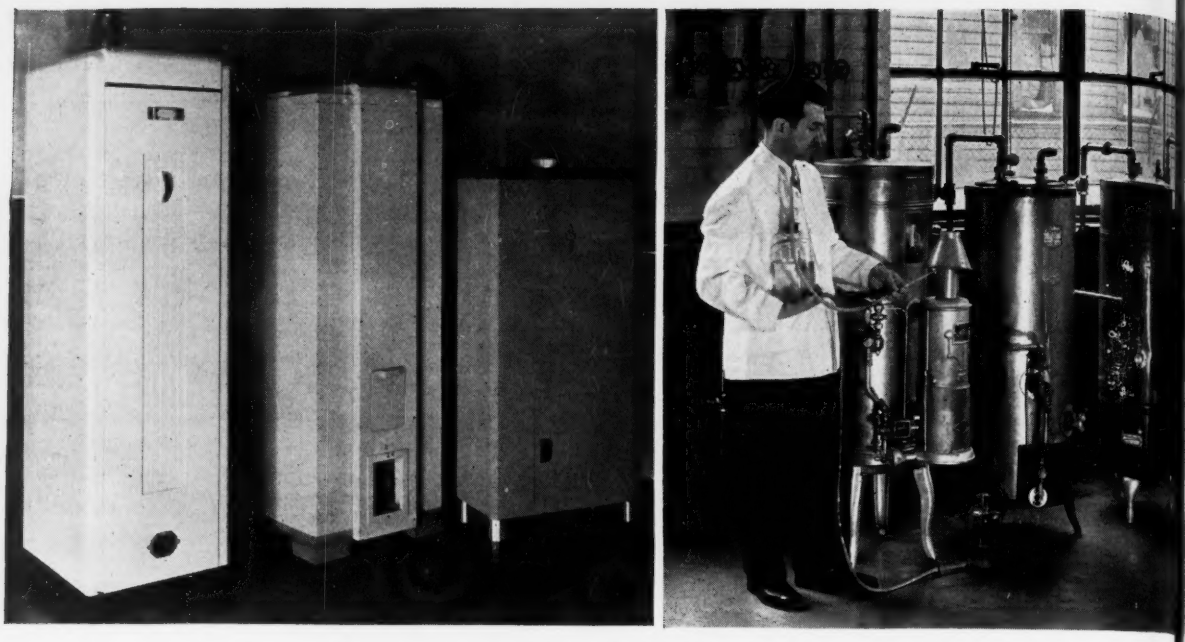
James C. Irwin

James C. Irwin, past-chairman of the Standards Council and member of the Board of Directors of the American Standards Association, died March 20 at the age of 71. Mr. Irwin was valuation engineer of the Boston & Albany Railroad from 1912 until his retirement 18 months ago.

Mr. Irwin received the degree of civil engineer from the University of Pennsylvania in 1891, and after a year of teaching entered the service of the New York Central Railroad as superintendent of signals on the Mohawk Division. He later became signal engineer of the New York Central System and during the period of electrification of the New York suburban zone was superintendent of construction of the zone. He was resident engineer of the New York Central Railroad in the Grand Central Terminal in New York from 1906 to 1909. From 1909 to 1912 Mr. Irwin was chief engineer of the Rutland Railroad. From 1912 until his retirement in 1938 he was with the Boston & Albany Railroad.

Mr. Irwin was a former president of the American Railway Engineering Association, a member of the New England and New York Railroad Clubs, and a member of the American Railway Guild.

His interest in the work of the American Standards Association began in 1930 when he became a member of the ASA Standards Council representing the Engineering Division of the Association of American Railroads. In 1933 he was elected chairman of the Standards Council and served in that capacity during 1934, 1935, and 1936. As chairman of the Standards Council, Mr. Irwin was a member of the Board of Directors of the American Standards Association during those three years, and as past-chairman of the Council continued as a member of the Board during 1937, 1938, and 1939.



How gas-appliance design has changed in ten years. Left—Modern automatic water heaters; Right—Water heaters under test, 1931

Consumers Benefit—

Revised Gas-Appliance Standards Reflect Progress in Industry

by

R. M. Conner[1]

Secretary, Sectional Committee on Approval and Installation Requirements for Gas-Burning Appliances

A RECORD in the history of the preparation and development of American Standards for gas appliances and accessories was established when, on February 23, 1940, ten sets of revisions were approved by the American Standards Association. In each instance, the revisions strengthen the former specifications and also extend them to cover new developments, and improvements in design made since the publication of the current standards. These new specifications become effective January 1, 1941. They have been published and are now being distributed to interested manufacturers.

Included in these revised American Standards are six sets of approval requirements covering central-heating gas equipment, clothes dryers, domestic gas ranges, hot plates and laundry stoves, space heaters, and unit heaters. Three sets of listing requirements covering conversion burners, automatic pilots, and gas appliance thermostats, as well as installation requirements for conversion burners were also approved. Revisions of these specifications will undoubtedly result in more substantial construction and increased efficiency of operation of the equipment covered, thus providing additional benefits to consumers.

In addition to many improvements in the exterior appearance of modern domestic gas ap-

[1]Director, American Gas Association Testing Laboratories, Cleveland, Ohio.

pliances, which increase their eye-appeal to the consumer as well as adapt them to the decorative scheme of modern homes, many changes have been made in design and construction which result in higher operating efficiencies. To mention a single example, the thermal efficiency of top burners of a gas range has increased during the last ten years about 50 per cent. This means that about one-half more heat is made available for the same amount of gas burned. This reduction in consumers' gas bills, and at the same time increased convenience in using gas appliances, has resulted in greater consumer confidence in the satisfactory performance of the tested and approved appliances offered for sale.

Revisions Effective January 1941

Consumers will be particularly interested in the revisions which become effective January 1, 1941.

Numerous specifications have been added to safeguard consumers' interests. In the case of ranges, for example, it is now mandatory that a model classified as insulated display the word "Insulated" on the name plate. Although both insulated and uninsulated ranges comply with American Standard basic requirements, an insulated range presents much cooler oven surfaces and thus liberates less heat into the kitchen. At the same time the amount of gas required to maintain a given temperature for roasting or baking is materially less than for an uninsulated model. Furthermore, the standards have been revised to permit installation of insulated ranges closer to kitchen walls than uninsulated ranges. This marking will serve, therefore, as a guide for the proper installation of domestic gas ranges, as well as assisting the consumer in making his choice.

Additional statements on the name plates of furnaces and other central house-heating equipment will further safeguard the consumer against misuse of approved gas-heating appliances by indicating how such equipment was tested in the Laboratories. For example, furnaces will be marked prominently to indicate whether they were approved with or without a blower. In the same manner, a unit heater will have the words "Unit Heater" shown as a permanent marking. From this marking the consumer can ascertain clearly what he is buying and can determine whether installation is made accordingly. For added safety, because unit heaters may be installed and operated in garages and airplane hangars, proper installation instructions for such conditions are required on their name plates. These instructions, for example, include among other information that the heater should be installed at least eight feet above the floor.

A considerable number of consumers will be benefited by the extension of the American Standards for central house-heating equipment, space heaters, and unit heaters, to cover their use with

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ALMOST essential function of any agency dedicated to promoting consumers' standards is its continuous activity not only in maintaining up-to-date standards but also in extending them to cover new developments and improvements in that particular field. This constitutes in itself a progressive standardization program which greatly benefits the consumers it serves. On such a foundation the rapid progress of the American Gas Association's standardization program is based.

The American gas industry anticipated the current popular demand for tested and certified commodities—from foods to manufactured products—when in 1925 it established the American Gas Association Testing Laboratories in Cleveland, Ohio. It also recognized the need for an authoritative national guide to serve as a consumer's aid in purchasing gas equipment which would be durably constructed and operate safely and efficiently. As manufacturers and their customers in increasing numbers recognized the significance and value of the Laboratories Approval Seal, this program was expanded and the testing facilities of the Laboratories increased. A branch was established in Los Angeles in 1931. This was replaced by a modern laboratories building erected and placed in operation late in 1939 and providing three times the former space.

Recognizing the importance and value of the standardization activities of the American Standards Association, arrangements were made in 1930 so that the American Gas Association Approval Requirements Committee was expanded to include the required balance between utility, manufacturer, and general interest and consumer groups, and became a sectional committee, Project Z21, of the American Standards Association. Today, specifications covering practically all domestic gas appliances and accessories have been accepted as American Standard. — ***R. B. Harper, American Gas Association, Chairman ASA Committee Z21.***

Testing wall and floor temperatures

Left **— New standards permit insulated stoves to fit close to walls;** ***Below*** **— 1931 gas ranges undergoing the same test**

liquefied petroleum gases and butane-air gas. Bottled gases are now utilized by an increasing number of consumers in territories to which city gas lines have not been extended. They were first generally employed for cooking and water heating; however, satisfactory consumer experience with Laboratories'-approved gas ranges and water heaters resulted in an increasing demand for approval on other types of heating equipment. A similar condition existed among consumers in small communities in which butane-air gas is distributed. This demand may now be met through the new revised standards which provide for testing and approving all major types of domestic gas appliances for use with liquefied petroleum gases and butane-air.

In all cases these specify that each appliance approved for use with such gases must be marked: "This appliance is approved for use only with approved liquefied petroleum gases." Those appliances approved for use with butane-air gas are required to display the statement: "This appliance is approved for use only with butane-air gas." Such marking greatly assists the consumer in selecting equipment for satisfactory operation on these fuels.

Many mechanical and electrical controls have been developed and applied to gas-burning equipment to provide greater convenience and ease of operation. Among these, special mention may be made of automatic pilots, and temperature control devices of various kinds. Such accessories are now in wide use on all types of gas equipment. Standards covering them have therefore been expanded to keep pace with their development and use, thus assuring continued satisfaction and service for the public. Furthermore, special attention has been devoted to provisions for proper installation and wiring of electrically operated controls, these being based on the latest edition of the National Electrical Code approved by the American Standards Association.

Culmination of Several Years Work

The foregoing highlights of the ten recently revised American Standard requirements represent the culmination of several years constant investigation and revision of current requirements for the benefit of the gas consumer. More than 300 national authorities on gas-appliance utilization form the personnel of subcommittees of the American Gas Association's Approval Requirements Committee, which is organized as an ASA committee and operates under the procedure of the American Standards Association. Chosen from all parts of the country, they represent manufacturers, gas companies, and general and consumer interests and their decisions are based on a national perspective of each problem. In their role as producers of appliances, manufac-

turer representatives are in close contact with their customers' preferences for such products. Similarly, gas utilities are in intimate touch with installation and servicing of appliances in consumers' homes and are in excellent position to recommend such changes as will improve their construction and performance. The consumer is directly represented through such general-interest groups as the National Bureau of Standards, National Safety Council, American Home Economics Association, and others. These three groups of interests balance each other, with the result that standards formulated and approved by them cover the field from all points of view.

30,000 Models Approved

In the comparatively short period during which the American Gas Association Testing Laboratories have been carrying on its testing and approval activities, more than 30,000 models of all types of gas-burning equipment have been approved, thus making available to the consumer a wide selection of tested and approved appliances for various domestic purposes. Moreover, the activities of the Laboratories do not stop with the awarding of their trade-marked Approval Seal. Frequent inspections of certified products are made in manufacturers' factories, dealers' and jobbers' warehouses and sales floors, and also in consumers' homes to ascertain that production models conform in every detail with those originally approved. Another valuable function of the Laboratories is the monthly publication of a directory of approved appliances and accessories. This directory enjoys wide distribution among utilities, dealers, department stores, mail-order houses and other retail outlets interested in merchandising gas-consuming equipment which complies with current American Standards. It also furnishes a guide to consumers in making available an up-to-date list of all such equipment bearing a trade-marked emblem, the significance of which is widely recognized. In this way, the Laboratories of the American Gas Association render a real service to the gas-consuming public.

Ten Gas-Appliance Standards Now Brought Up-to-Date

AGA Seal of Approval Shows Appliances Meet Standard Requirements

The ten gas-appliance standards which have been brought up-to-date and approved by the American Standards Association cover:

- Central Heating Gas Appliances, American Standard Approval Requirements Z21.13-1940
- Domestic Gas Ranges, American Standard Approval Requirements Z21.1-1940
- Gas Clothes Dryers, American Standard Approval Requirements Z21.5-1940
- Gas Conversion Burners, American Standard Approval Requirements Z21.17-1940
- Gas Space Heaters, American Standard Approval Requirements Z21.11-1940
- Gas Unit Heaters, American Standard Approval Requirements Z21.16-1940
- Hot Plates and Laundry Stoves, American Standard Approval Requirements Z21.9-1940
- Automatic Pilots, American Standard Listing Requirements Z21.20-1940
- Installation of Conversion Burners for House Heating and Water Heating Appliances, American Standard Requirements Z21.8-1940
- Gas Appliance Thermostats, American Standard Listing Requirements Z21.23-1940

These requirements, prepared by a representative committee sponsored by the American Gas Association and working under the procedure of the American Standards Association, are used by the AGA Laboratories in their tests. Appliances which meet these requirements are marked with the AGA Seal of Approval.

Revision of Commercial Standard For Tents, Tarpaulins, and Covers Circulated for Approval

A recommended revision of Cotton Fabric Tents, Tarpaulins, and Covers, Commercial Standard CS28-32, has been submitted to producers, distributors, and users for acceptance before publication by the National Bureau of Standards.

The major changes comprise the inclusion of methods of test and ratings for the water-repellent quality of these articles, and recommended wordings for use by manufacturers and distributors to certify that their products comply with the commercial standard.

Mimeographed copies of the Recommended Revision are available from the National Bureau of Standards, Washington, D. C.

Court Orders Trade Association To Set Up Separate Grading Bureau

ON February 21 the Federal court in New Orleans, La., filed a consent decree ordering that the Southern Pine Association shall hereafter separate all its grading rules, standardization, inspection, and grade-marking activities from its other association work. The decree was issued under the anti-trust laws, and was accompanied by a fine to the association.

In a letter to the New York Journal of Commerce, March 26, Thurman Arnold, Assistant Attorney General, stated that it was not the program of standardization and inspection that lead to the consent decree but the use made of it. He said:

"The consent decree entered into on February 21, 1940, between the United States and the defendants provides that the defendants shall be free to engage in systems of standardizing grades and sizes of lumber which do not operate illegally to restrain interstate trade and commerce.

"Thus it will be seen that standardization programs in and of themselves are not condemned by the department. It is the wrongful use to which such programs have been put that has been questioned."

The decree provides:

"That the defendant Southern Pine Association, hereinafter designated as SPA, shall accomplish a separation of all grading rules, standardization, inspection, and grade-marking activities, on the one hand, from any and all other activities carried on by SPA, on the other hand. Said grading, standardization, inspection, and grade-marking activities shall thereafter be carried on only by and through a separate and autonomous bureau of said Association to be newly created and to be known and designated as Southern Pine Inspection Bureau. The services and activities of said Bureau will be at all times available on equal terms to all manufacturers of Southern pine lumber without favor or discrimination and without any requirement for joining or otherwise subscribing to said SPA or to any other trade association, or supporting any service or activity other than those of grading, standardization, grade-marking and inspection to be carried on by the Bureau aforesaid. . . .

"The . . . Board of Governors or other such governing body shall fix from time to time such charges and fees as are found to be necessary to cover the actual cost, including necessary reserves and provisions for contingencies, of carrying out the functions of said Bureau; provided, however, that said Bureau shall not voluntarily contribute to the financial support of nor pay membership dues in any trade association; and provided further, that contributions in support of specific activities by any national organization engaged in research, promotion, or coordination of . . . grading, standardization, grade-marking, and inspection rules and practices on a national basis are not hereby prohibited. Such charges and fees shall be uniformly assessed against subscribers to the services of said Bureau without regard to their membership or non-membership in any trade association. . . .

"The matter of making and enforcing rules and regulations for the use of its grade-mark, the authorizing or withholding of such use, the revocation of authority for such use, and all other governing powers relating to the formulation and administration of its grading rules, standardization practices, and grade-marking and inspection services shall be solely by and through said Bureau and not by or through any other agency of said Association, and all of such matters shall be so handled that fair and non-discriminatory treatment shall be accorded to all manufacturers of . . . without any requirement for joining any trade association. . . ."—*(U. S. vs. Southern Pine Association).*

Standard Gauge for Standard Football

Standard calibration of footballs will make it difficult from now on for a team which specializes in passing to buy a slim football which is easier to handle, or for a team which likes to kick to buy a short, fat ball into which the kicker's toes can really sink, says a news item in *Aluminum News Letter* recently. A National Collegiate Approved Templet has been developed, with which the referee can check the size of the ball.

Lists of Standards Published by Australia, Britain, New Zealand

Complete printed lists of the standards approved and published by the national standardizing associations in Australia, Great Britain, and New Zealand have just been received by the American Standards Association. All standards approved by these associations are listed. ASA members may borrow or order copies of the lists without charge through the Library of the American Standards Association.

National Safety Code Program Goes Forward Under ASA

Two new projects, two new standards, and 17 revisions help keep safety standards in line with industry's needs

by

Cyril Ainsworth

Secretary, ASA Safety Code Correlating Committee

PROGRESS in the development of the National Safety Code Program has been shown during the past 18 months by the initiation of two new projects in the safety field, approval of two new standards, and reapproval of 17 standards revised to include the latest safe practices.

The growing demand by industry for safety standards which will keep pace with progress in manufacturing operations and with technical advances brought about the two new projects—for Household Ladders and for Industrial Stairs—as well as general conferences which considered the need for safety standards for identifying compressed gas cylinders, and for safety shoes. The first of these conferences will meet again in July. The second conference recommended the initiation of a project on safety shoes but is studying the possible scope of the work before making its final recommendations to the Standards Council of the ASA.

Household Ladders — Consumer demand, made known through retail distributing groups, brought about the request for specifications for household ladders. Industrial ladders, as covered by the American Standard Safety Code for the Construction, Care, and Use of Ladders (A14), have been found to be too heavy for practical home use. As a result there is an urgent need for specifications for safe household ladders which will help reduce the extremely high accident toll every year from falls in homes. Under the leadership of the National Safety Council, therefore, a new committee is being formed which includes ladder manufacturers, consumers, retail distributors, insurance groups, and technical experts to develop standards for ladders for household and farm use where no industrial operations are involved.

General Industrial Stairs—A request from the Division of Labor Standards, U. S. Department of Labor, resulted in the initiation of a project on General Industrial Stairs, to include standards for the construction and maintenance of stairs built around machinery, tanks, and other equipment, and those leading to and from floors, platforms, and pits, wherever such stairs are not used exclusively for fire exit purposes. The need for uniform standards for the construction of this type of stairs is common to many widely varied industries. The petroleum and gas industries, however, face so serious a problem in the need for safe stairways around the interior and exterior of tanks, that this alone would warrant the development of such specifications. The American Society of Safety Engineers, Engineering Section, National Safety Council, has been asked by the ASA to accept responsibility for the technical and administrative leadership of the project and it is expected that a representative committee will be organized to go forward with the work within the next few months.

Safety Shoes—The American Gas Association, in requesting the development of specifications for safety shoes under ASA procedure, pointed out that the widespread use of this type of safety equipment makes performance standards vitally important. What assurance, for instance, has a purchaser of safety shoes that a particular brand will withstand excessive impact, exposure to acids, or contact with electric current? Yet one or more of these hazards, as well as many others, may be present in any number of industrial operations. Uniform standards are needed, therefore,

for measuring the exact degree of protection afforded by any brand of safety shoes when worn under specific conditions.

A general conference, held in March of this year to consider the desirability of initiating a project on safety shoes, approved the request of the American Gas Association and appointed a committee to recommend scope, sponsorship, and the organizations to be invited to take part in the development of standards. Recommendations on all these points will be presented to the Standards Council and, if approved, an ASA committee will be formed to proceed with the technical work.

Identification of Compressed Gas Cylinders—The question of standards for Identification of Compressed Gas Cylinders has been a recurring one to the American Standards Association since 1925, when a request was received from the Industrial Accident Commission of California for the initiation of a project. At that time the manufacturers of compressed gases, through their trade associations, indicated that they would not be willing to cooperate in such an undertaking, so the project was not initiated. The National Electrical Manufacturers Association, in June, 1939, asked the ASA to again consider standards for identifying compressed gas cylinders, and a conference was held in January, 1940. Many interested groups attended. The conference discussions, and the experience of users of these gases in the electrical manufacturing industry, indicated that there is considerable difficulty in identifying the contents of cylinders, which are at present marked in color to indicate ownership, and by stencil to indicate content. The lack of standardization of fittings also caused difficulty. The problem of users in identifying the contents of cylinders came about because in many cases the stencils were illegible, and in other cases omitted entirely, it was explained.

The conference asked the Compressed Gas Manufacturers Association to review its Resolutions regarding stenciling cylinders to determine whether standards can be developed. The meeting adjourned with the understanding that this request would be presented to the Compressed Gas Manufacturers Association and that the Association's report would be received at a second conference to be called in July 1940.

Two New Standards Approved

Standards for the Inspection of Motor Vehicles—The approval, in August 1939, of Standards for the Inspection of Motor Vehicles (D7), was of outstanding importance in the automotive field, both to the producer and to the consumer. Because of the growing number of states which require periodic inspection of motor vehicles, national standards covering car performance with relation to brakes, headlights, steering apparatus, tires and wheel alignment, accessories, and miscellaneous equipment such as mirrors, horns, and wipers, were obviously desirable. Under the leadership of the American Association of Motor Vehicle Administrators and the National Conservation Bureau, a widely representative committee was formed which included automobile manufacturers, automotive engineers, inspection engineers, and automobile, bus, and truck operators.

Extensive research was carried on through insurance engineers and inspection stations throughout the country to determine the type of standards needed. The resulting data, after being analyzed, made it apparent that inconsistent and widely varied procedures were being followed in different states in order to accomplish what was considered to be adequate inspection of motor vehicles. This information was then turned over to four subcommittees in charge of various sections of the project, and research was continued. The American Standard Inspection Requirements for Motor Vehicles, approved in 1939, represented the combined reports of three of these subcommittees, and covered all sections of the code with the exception of the one on Brakes. The subcommittee on brakes has not as yet reached an agreement on standards for brake performance or methods of brake testing, but is continuing intensive research.

Safety Codes for the Prevention of Dust Explosions—The second newly approved American Standard is one of a series for the prevention of dust explosions in industrial plants which have been developed under the joint sponsorship of the U. S. Department of Agriculture and the National Fire Protection Association. The Safety Code for the Prevention of Dust Explosions in the Manufacture of Aluminum Bronze Powder (Z12.11) is the eleventh code to be approved in this field. The U. S. Department of Agriculture, through its Chemical Engineering Research Division, carries on continuous investigations to determine the cause of dust explosions in industrial plants, and to discover methods for their prevention. With the cooperation of the National Fire Protection Association these investigations are conducted in laboratories, testing stations, and in locations where actual dust explosions have occurred. Several new codes, among them one covering sulphur grinding plants and country (rural) grain elevators, are now being prepared by the technical committee in charge of this project. The following ten codes were revised to include the latest information available for the prevention of dust explosions in their industries and

were approved as American Standards in January 1940:

- Safety Code for the Installation of Pulverized Fuel Systems—Z12.1-1940
- Safety Code for the Prevention of Dust Explosions in Starch Factories—Z12.2-1940
- Safety Code for the Prevention of Dust Explosions in Flour and Feed Mills—Z12.3-1940
- Safety Code for the Prevention of Dust Explosions in Terminal Grain Elevators—Z12.4-1940
- Safety Code for the Prevention of Dust Explosions in Woodworking Plants—Z12.5-1940
- Safety Code for Pulverizing Systems for Sugar and Cocoa—Z12.6-1940
- Safety Code for the Prevention of Dust Explosions in Coal Pneumatic Cleaning Plants—Z12.7-1940
- Safety Code for the Prevention of Dust Explosions in Wood Flour Manufacturing Establishments—Z12.8-1940
- Safety Code for the Prevention of Dust Ignitions in Spice Grinding Plants—Z12.9-1940
- Safety Code for the Use of Inert Gas for Fire and Explosion Prevention—Z12.10-1940

These codes have been printed in a single publication by the National Fire Protection Association, together with important technical and factual data of value to all interested in this subject.

Seven Standards Revised

In addition to the standards for dust explosion prevention, the following revised editions of American Standards have also received ASA approval:

- Manual of Accident Prevention in Construction (A10.1-1939)
- Building Exits Code (A9-1940)
- Safety Code for Mechanical Refrigeration (B9-1939)
- Safety Code for Compressed Air Machinery and Equipment (B19-1938)
- Safety Code for the Protection of Heads, Eyes and Respiratory Organs of Industrial Workers (Z2-1938)
- Regulations for the Installation of Air Conditioning, Warm Air Heating, Air Cooling and Ventilating Systems (Z33.2-1939)
- National Electrical Safety Code, Part 4 — Safety Rules for the Operation of Electrical Equipment and Lines (C2.4-1939)

New Policy on Guards

Individual safety standards are constantly under revision due to the rapid advances being made in engineering knowledge and practice. In addition to this general policy of revision, the Safety Code Correlating Committee has now approved the recommendations of the National Safety Council that performance requirements for safety devices should be included in safety standards. This policy may offer a reason for revising the entire list of safety standards. All safety code committees have been instructed by the Safety Code Correlating Committee to include specifications for guards and safety equipment in any code which is being developed or revised if that code contains requirements for the installation and use of guards or safety devices.

The entire group of safety standards in the mining field are being reviewed by the Mining Standardization Correlating Committee and recommendations for revisions will be made to sponsors.

Progress has been shown in the revision of the National Electrical Safety Code by approval of Part 4, and completion by the technical subcommittee of Part 5, Safety Rules for Radio Installations. This latter section of the code will be submitted to the ASA for approval within the next month.

Standards of Special Interest

From the large list of safety standards now being revised the following activities are of particular interest:

Code of Lighting: Factories, Mills and Other Work Places (A11-1930)—The sponsor, the Illuminating Engineering Society, through its technical committees, has carried on extensive research and studies of various industrial operations and processes from which to obtain data for revisions of code requirements. This material has been published in a special bulletin, copies of which are available upon request from the ASA office at 20 cents each.

Safety Code for Mechanical Refrigeration—Although a revision of this standard was approved only last year a special committee is now at work preparing a code of colors for identifying refrigerating piping systems. This color scheme will be within the framework of the American Recommended Practice Scheme for the Identification of Piping Systems (A13-1928).

Specifications and Methods of Test for Safety Glass—A special committee is at present developing recommendations to be made to the full ASA committee for possible revisions of the code, including research which may be necessary in order to obtain facts on which to base revisions.

Work in Compressed Air—Work on the development of this code has been delayed pending the completion of research by the Navy Department, the U. S. Public Health Service, and the Bureau of Mines. It is expected that this research will produce factual data which may have a vital effect on the generally accepted rates of decompression to which workers are subjected when engaged in work under compressed air. Reports which will enable the sectional committee to complete its assignment are expected about the middle of the year.

ASTM Committees Meet To Act on Standards

A Symposium on New Materials in Transportation, and meetings of 19 technical committees, featured the American Society for Testing Materials Committee Week in Detroit March 4 to 8. Revisions to existing standards and proposals for new standards and tentative standards were considered by the ASTM committees. Action taken on many of them will be referred to the Annual Meeting of the Society for final action in the fall.

The following committees held meetings during Committee Week:

Steel, A-1
Cast-Iron, A-3
Corrosion of Iron and Steel, A-5
Malleable Iron Castings, A-7
Iron-Chromium-Nickel, A-10
Non-Ferrous Metals and Alloys, B-2
Corrosion of Non-Ferrous Metals, B-3
Die-Cast Metals and Alloys, B-6
Light Metals and Alloys, B-7
Refractories, C-8
Thermal Insulating Materials, C-16
Gaseous Fuels, Subcommittees III and V, D-3
Road and Paving Materials, D-4
Coal and Coke, D-5
Rubber Products, D-11
Soils for Engineering Purposes, D-18
Methods of Testing (Sections only), E-1
Metallography, E-4
Research Committee on Fatigue of Metals

Seven technical papers made up the Symposium on New Materials in Transportation:

Exhaust Valve Materials for Internal Combustion Engines, by S. D. Heron, O. E. Harder, R. M. Nestor
Selection and Application of Automotive Steels, by A. L. Boegehold, W. H. Graves, E. W. Upham
Rubber of Tomorrow, by S. M. Cadwell
Advances in the Uses of Concrete in Transportation, by Miles D. Catton
Recent Developments in the Use of Asphalt for Transportation Purposes, by Bernard E. Gray
Trends in the Properties of Volatile Liquid Fuels, by D. P. Barnard, A. H. Fox
Developments in Lubrication, by J. P. Stewart, R. C. Moran, C. M. Reiff

It is hoped that additional information about cooling ratio will become available soon as a help in deciding what hardenability tests to standardize.

Bureau of Standards Issues Data on Bushel Weights

Information on the bushel weights established by Federal and State laws, as well as general facts about Federal and State laws having a direct bearing on the legal bushel weights, are given in a pamphlet just issued by the National Bureau of Standards. The circular covers Federal legislation, State legislation, and legal bushel weights. It consists primarily of two tables. The principal table lists the bushel-weight information for those commodities for which weights have been fixed in more than four States; the other table lists the bushel weights fixed in only four States or less. In both tables commodities are listed alphabetically. Exceptions, qualifications, and other relevant information are supplied by footnotes to the table.

"In recent years numerous changes have been made in the legal weights for fruits, vegetables, and other dry commodities as established by the laws of the several States," the National Bureau of Standards explains in announcing publication of the new pamphlet. "In some cases, values previously fixed have been changed, or values for commodities not previously listed have been added. Occasionally a commodity previously listed has been withdrawn, and in one case a State repealed all bushel weights in favor of a requirement for sales based on weight."

Copies of the pamphlet, Legal Weights per Bushel for Various Commodities, Circular C425, are available from the Superintendent of Documents, Washington, D. C., at five cents each.

AAR Appoints Sorensen On Standards Council

A. L. Sorensen, manager of stores, Erie Railroad, has been named by the Purchase and Stores Division of the Association of American Railroads as alternate representative on the Standards Council of the American Standards Association.

Mr. Sorensen succeeds C. B. Tobey, who is no longer a member of the General Committee of the AAR Purchase and Stores Division.

Standards Useful to Architects

"Architects desire, and, indeed, require, the utmost freedom in dealing with their designs; yet there is perhaps no profession to whom industrial standardization, properly organized, can be so useful. Architects will agree there is one factor which has always been common to the finest architecture, namely, soundness of materials. This is as apparent in ancient Athens as, for instance, in the Battersea Power Station; and the British Standards are more than anything else concerned with the quality of materials."—*C. le Maistre, Director, British Standards Institution.*

Revision of Bolt Standard Features Single Scale of Thread Lengths

Four Styles of Carriage Bolts – Square Neck, Ribbed Neck, Fin Neck, and Countersunk – Are Covered in American Standard for Round Unslotted Head Bolts

Standard, Originally Approved in 1928, Brings Former Wide Variety in Size and Design into Uniform Series

by

Merrill C. Horine[1]

Chairman, Subcommittee on Round Unslotted Head Bolts, ASA Committee on Bolt, Nut, and Rivet Proportions

HARDLY any type of bolt has assumed such a broad variation in sizes, proportions, and design as the carriage bolt and its near-relations, the button-head, step, and countersunk bolts. From the time when each wagon builder turned out or ordered from the bolt manufacturer bolts of whatever form or size suited his fancy, down to that day 18 years ago when the American Standards Association first undertook their standardization, they did not even have commonly understood names, nor was there a general class name by which they could be referred to collectively.

Each industry using bolts of this description had its own notions as to how these useful fastenings should be made and tolerances varied from the proverbial "loose" and "tight" all the way up to limits distinctly in the "fussy" classification.

The distinguishing characteristic of this class of bolts is that it has neither a wrench head nor a slotted head, but instead has a head with self-holding capabilities, there being a form beneath the head adapted to being driven into the material through which it is inserted so as to lock it. These under-head forms vary according to the purpose for which the bolt is used and also as to the material into which they are to be inserted. For wood, the square-neck carriage bolt, its countersunk pattern, or its broad-headed companion the step bolt, is generally used. For soft metal, such as brass or plastics, the rubber-neck carriage bolt is provided and for sheet metal, the fin neck variety. For a drive fit into harder material, the button-head or countersunk bolts are used. Bolts of this description are useful where a wrench-head or slotted-head bolt would be unsightly or an obstruction, or in locations where it is difficult to reach the head for holding.

Standardization of this class of bolts began with the adoption of a generic term, namely "Round, Unslotted Head Bolts," when they were first considered by the ASA Sectional Committee on Standardization of Bolt, Nut, and Rivet Proportions in 1922, under the joint sponsorship of the Society of Automotive Engineers and the American Society of Mechanical Engineers. Standardization of this particular group of bolts was organized as Subcommittee No. 5 and the first report, submitted in February 1923, concerned itself with standard head dimensions covering carriage, step, and machine bolts only.

Broad circularization of these proposals brought out the demand for body and thread lengths to be added to their scope. Accordingly the co-operation of Subcommittee No. 7 on Body Dimensions and Materials was secured and a set of tables was submitted to members of the committee in 1925. This was later printed and circulated widely. As a result of the many helpful

[1]Sales Promotion Manager, Mack-International Motor Truck Corporation; representative of the Society of Automotive Engineers on ASA Committee on Bolt, Nut, and Rivet Proportions (B18).

suggestions received, the first formal report was approved by the subcommittee in April, 1926. It was unanimously approved by the sectional committee.

Still, it was not a standard. Upon transmission to the sponsor bodies, the ASME reported favorably, but the SAE insisted that the data on body and thread lengths be noted as information only and not as a part of the standard. By the time this modification had been duly considered by the subcommittee and committee, then by the ASA as a whole, 22 months had rolled around, so that it was not until February 1928 that the first standard on Round, Unslotted Head Bolts was issued.

This standard stood unchallenged until 1934 when demand by the various user industries required numerous dimensional revisions to line up more nearly with changing demands. The body lengths were incorporated in the standards for the various forms of bolts and thread lengths were consolidated into a single Appendix, applying as a standard to all forms. By December 1938, this work was practically completed and after the usual period of consideration by members of the subcommittee, by the sponsor bodies, and finally by the committee, final editorial changes were adopted and the revised standard was approved by the American Standards Association in November, 1939.

The standard as it now stands covers four styles of carriage bolts, namely, square neck, ribbed neck, fin neck, and countersunk; button-head bolts, step bolts and countersunk bolts, ranging in sizes from No. 10 up to 1 inch in some cases. Among the most important merits of the new standard are the use of a single scale of thread lengths for all types and styles of similar length and diameter. All have ASA coarse threads. All lengths are established in a uniform manner, as are thread lengths.

Such bolts are used extensively in vehicle body construction, car building, and in the implement industry; but are to be found in a vast variety of applications aside from these. They are an important item in the hardware and bolt industries. Simplification of catalogs and inventory through standardization should be productive of great economy in the aggregate as well as greater convenience to the user through an assurance of interchangeability.

New Zealand Revised Code Provides Requirements for Concrete Building

Revisions to several sections of its Standard Code of Building By-Laws, which is being developed to provide a comprehensive national building code covering all phases of building activity, have been issued in two parts by the New Zealand Standards Institute. The two volumes so far completed are:

Preliminary, Offences, Permits, and Basic Requirements for Building Construction, Parts I-IV
Reinforced and Plain Concrete Construction and Panel Walls in Framed Structures, Part V-VI

In revising these sections, every consideration has been given to improvements suggested as a result of the practical application of the previous provisions. The latest developments have also been considered, in order that the revised requirements may be an authoritative Code of Practice based upon what is best in this country at the present time, the New Zealand Standards Institute announces.

The first volume is the groundwork for building construction, and deals with such questions as loads to be carried, wind pressure to be provided against, and earthquake stresses to be resisted, which do not vary with the materials used. The remaining volumes will deal with the provisions peculiar to a specific class of structure, building material, or method of design.

Part V covers the use of both reinforced and plain concrete in the construction of buildings, defining the materials to be used, the standards of workmanship, and details of design, with special attention to the resistance of stresses developed by earthquake shocks.

Part VI provides for walls in the form of rigid and non-rigid panels.

Parts I-VI together, therefore, make up a National Building Code governing the erection of a complete building in reinforced concrete construction, the New Zealand Institute points out.

As other parts are completed, similar codes will be provided for other types of construction.

Copies of the two volumes may be ordered from the New Zealand Standards Institute through the American Standards Association Library.

NRDGA Compiles FTC Rulings

The Merchandising Division of the National Retail Dry Goods Association has compiled in a *Retailer's Reference Book* the rulings of the Federal Trade Commission on materials of all kinds, apparel and accessories, foods, drugs and cosmetics, home-furnishings, and other miscellaneous items sold at retail. The book is available to retailers who are members of the NRDGA at $2.00 per copy.

NEMA Requests Tighter Fit In Standard Shaft Couplings

A FAIRLY tight fit is needed between the two halves of shaft couplings of the integrally forged flange type for hydroelectric units, the National Electrical Manufacturers Association declared recently in a request to the American Standards Association for a revision of the American Standard for Shaft Couplings (B49-1932). In applying the standard, NEMA finds part of it unsatisfactory because of the excessive tolerances permitted between the two halves of the coupling, the request states.

The National Electrical Manufacturers Association recommends that the table of tolerances below be substituted in place of the table in Note 1 of the American Standard.

In addition to the change in tolerances for the couplings, NEMA recommends that the standard be revised to require Jack bolts on couplings for shaft diameters less than 7 inches, as well as for those larger than 7 in. as specified at present. The following new table is suggested:

Shaft Diameter A	*Jack Bolts R* *Number of Bolts*	*Size*
3½	2	⅜
4	2	⅜
4½	2	⅜
5	2	½
5½	2	½
6	2	½
6½	2	¾

The original standard was approved in 1932 under the Existing Standards Method, with the understanding that revisions would be handled by a sectional committee. As a result of the ASME request for a revision, the American Society of Mechanical Engineers, sponsor for the project, has started work to organize a sectional committee under ASA procedure.

Nominal Diameter of Rabbet		*Limits of Recess*		*Limits of Projection*		*Resultant Fits*	
Over	To and Incl	Maximum Nom. Dia. plus	Minimum Nom. Dia. minus	Maximum Nom. Dia. plus	Minimum Nom. Dia. minus	Maximum Interference	Minimum Interference
2	10	.0005	0	.0010	.0005	.0010	0
10	24	.0010	0	.0015	.0010	.0015	0

Rabbet Fit of Shaft Couplings (Interference)

Conference Asks For Standards To Assure Safe "Safety Shoes"

STANDARD specifications and tests should be developed to determine how much weight or pressure protective footwear can withstand, and how to select shoes to assure safety in any type of dangerous occupation, it was decided by shoe manufacturers and retailers, representatives of industries in which safety shoes are used, and safety experts at a conference March 20. The conference voted to ask the American Standards Association to initiate a project to develop standards for protective footwear.

The conference was called by the American Standards Association at the request of the American Gas Association. In asking for the initiation of the project, the AGA explained that at the present time there are no specifications, tests, or other evaluating procedures which enable purchasers to make an intelligent choice from the many brands of safety shoes now available. They believe that proper tests will show that there is a limit to the amount of weight, pressure, or foot pounds impact which a safety toe can withstand, and that all industries using safety shoes to protect their workers should know the limits of protection afforded by these shoes. In some cases shoes sold as safety shoes have collapsed after several soakings by rain or snow, they said.

Work on such a project might be expected to show the extent of protection not only when the shoe is new but also when the first soles have been replaced or repaired. It would have an additional purpose in helping to reveal the true

value of this type of safety clothing, it was explained.

Discussion during the conference indicated that different requirements would probably be needed for different hazards. A railroad, for instance, finds it necessary to buy 12 or 15 kinds of shoes to protect the worker against as many different types of dangers—to resist acid, to insulate against electricity, or to protect against falling objects, among others. It was recommended that the project be broad enough in scope to cover all these safety requirements.

Following its decision to request initiation of the project, the conference appointed a subcommittee which will recommend a title, scope, and sponsor for the proposed project.

The organizations represented at the conference were:

American Gas Association
American Institute of Mining and Metallurgical Engineers
American Petroleum Institute
Associated General Contractors of America, Inc.
ASA Electric Light and Power Group:—Association of Edison Illuminating Companies; Edison Electric Institute
Industrial Safety Equipment Association
International Association of Industrial Accident Boards and Commissions
National Boot and Shoe Manufacturers Association
National Conservation Bureau
National Council of Shoe Retailers, Inc.
National Crushed Stone Association
National Electrical Manufacturers Association
National Shoe Retailers Association
New England Shoe and Leather Association
ASA Telephone Group: Bell Telephone System
U.S. War Department
Member-at-large, Dr. Dudley J. Morton

Department of Agriculture Establishes Standards for Canned Asparagus

Standards of identity for canned asparagus, adopted under the Food, Drug, and Cosmetic Act, establish standard types, styles, and grades of canned asparagus. "Culturally bleached" and "all green" asparagus are the two types covered in the requirements; peeled or unpeeled, spears or stalks, cuts, bottom cuts, or soup cuts are the styles; and U. S. Grade A or U. S. Fancy, U. S. Grade C or U. S. Standard, and U. S. Grade D or Substandard are the grades covered.

A schedule of recommended drained weights and head space for different can sizes is included, in addition to a schedule for grading sizes showing the size of the asparagus spear and the number of spears which should be contained in each type of can for each size grading.

The standards which were effective March 15 can be obtained from the Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C.

Government Specifications Received by ASA

The American Standards Association has received notice of the approval of the following Federal Specifications for the use of all departments of the Government. The date opposite the title of the specification is the date on which that specification becomes effective.

Aluminumware; bake-shop and kitchen. Amendment-1 RR-A-466 March 15, 1940
Belting; round, leather, vegetable-tanned. (new) KK-B-211 June 15, 1940
Boxes; wood-cleated-fiberboard. (new) NN-B-591 May 1, 1940
Chairs; operating, dental, motorless. Amendment-1 AA-C-326 March 15, 1940
Clamps; and hand-screws. Amendment-1 GGG-C-406 March 15, 1940
Conduit and fittings; fiber, bituminized. (new) W-C-581 April 15, 1940
Holsters, pistol; leather. (superseding KK-H-566) KK-H-566a June 15, 1940
Hose; oil-suction and discharge. (superseding ZZ-H-481a) ZZ-H-481b June 1, 1940
Hose; suction, water, smooth-bore. (superseding ZZ-H-561a) ZZ-H-561b June 1, 1940
Lumber and timber; hardwood. Amendment-2 MM-L-736 March 1, 1940
Mattresses; cotton (felted). (superseding V-M-81) V-M-81a May 15, 1940
Mopping-outfits. Amendment-1 RR-M-571 March 15, 1940
Padlocks. Amendment-3 FF-P-101a March 15, 1940
Paper; kraft, wrapping. Amendment-1 UU-P-268a March 15, 1940
Plumb-bobs. Amendment-1 GGG-P-501 March 15, 1940
Ribbons; hectograph. Amendment-1 DDD-R-291 June 1, 1940
Sausage; frankfurter-style. Amendment-1 PP-S-81 March 15, 1940
Steel, corrosion-resisting; plates, sheets, strips, and structural-shapes. (new) QQ-S-766 April 15, 1940
Soda, caustic (lye); (for cleaning purposes). (superseding P-S-631) P-S-631a April 15, 1940
Towels; paper. Amendment-3 UU-T-591 March 15, 1940
Traps; radiator, thermostatic, brass or bronze, low-pressure 100-square-foot-size (for land use). Amendment-1 WW-T-696 June 15, 1940
Varnish; interior. (superseding TT-V-71) TT-V-71a June 15, 1940
Wrenches; pipe. Amendment-1 GGG-W-651a March 15, 1940

Copies of these Federal Specifications may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at five cents each.

Committees Study Four-Inch Size As Basis for Building Coordination

FIVE committees studying how to coordinate building units made their first report to the ASA Committee on Coordination of Dimensions of Building Materials and Equipment March 25.

The five groups were appointed by the committee to develop and try out the 4-inch size increment as a basis for standard sizes and dimensions which will interfit within the building structure. Two major problems have been given special consideration by the study committees: first, coordination between various types and combinations of masonry walls; and second, coordination of openings in masonry walls with doors and windows to fit in these openings.

The study committees reported their activities as follows:

The ***Committee on Masonry Made of Structural Clay Products*** has been considering the possibility of standardizing brick and tile sizes on a brick which is nominally 8 inches long by 4 inches wide and laid three courses to 8 inches. In order to maintain coordination, standardization will be based always on nominal sizes which include the thickness of the mortar joint.

The ***Study Committee on Wood Doors and Windows*** has limited its studies to the ordinary types of wood windows. It has been shown that standardized installation details are possible if the sash sizes are based on the 4 inch increment. The committee is now considering a definite suggestion for using present stock window sizes for coordination with masonry. This suggestion calls for a single standard for wood allowance, thickness of stock for frames, and pitch of wood sills. If this degree of standardization is acceptable to the wood window manufacturers, a satisfactory coordination with ordinary types of masonry walls can apparently be accomplished with a single series of present stock sash sizes.

It is hoped that the details showing the coordination of these suggested sizes for wood sash with masonry openings will be ready to be submitted to the masonry study groups and the Executive Committee soon.

Study Committee on Concrete Blocks. The studies for this group have been based on a nominal block size 16 in. long by 8 in. wide by 8 in. high. The studies indicate that with half height and half and three-quarter length blocks, walls are readily laid out on the 4 in. increment. The studies indicate that the coordination of this masonry should be accomplished with relative ease and substantial economies.

The studies have concentrated on the standardization of cast stone sills and lintels and indicate the possibility of substantial economies and improvements on these items. The standardization would include a complete variety of sill and lintel types as, for example, sills that are slip or lug, plain wash or seated, wide or narrow with nailing grounds behind them. The details include the application of cast stone sills and lintels

Members of the Special Study Committees appointed by the ASA Committee on Coordination of Dimensions of Building Materials and Equipment are:

Masonry Made of Structural Clay Products, Study Committee 1—
Harry C. Plummer, Structural Clay Products Institute, *Chairman*
Frederick Heath, Jr., Colonial Clays, Inc.
Charles W. Hammett, Hammett Company
E. Philip Schrier, Architect
Hyman Cunin, United States Housing Authority
M. W. Adams, Modular Service Association

Wood Doors and Windows, Study Committee 2—
S. O. Hall, National Door Manufacturers Association, *Chairman*
Clarence A. Jensen, Architect
H. H. Hobart, Curtis Companies, Inc.
B. J. Triller, Farley and Loetscher Manufacturing Co.
M. W. Adams, Modular Service Association

Masonry Made of Concrete and Cast Stone, Study Committee 3—
E. W. Dienhart, National Concrete Masonry Association, *Chairman*
W. W. Harding, Architect
C. G. Walker, Cast Stone Institute
Roy Peck, Western Brick Company
M. W. Adams, Modular Service Association

Metal Windows, Study Committee 4—
W. C. Randall, Detroit Steel Products Company, *Chairman*
J. R. Montgomery, Truscon Steel Company
R. J. Carlson, Hope's Windows, Inc.
R. L. Clingerman, Wm. Bayley Company
Myron J. Jones, Metal Window Institute
M. W. Adams, Modular Service Association

Natural Stones, Study Committee 5—
F. J. Plimpton, Vermont Marble Company, *Chairman*
Harry Furlong, Indiana Limestone Company of N. Y.
F. Albert Fichtel, Swenson Granite Company
Lorimer Rich, Architect
M. W. Adams, Modular Service Association

to brick walls as well as to the block walls.

The ***Study Committee on Metal Windows,*** representing the important manufacturers of steel casements, has presented a suggestion for standardizing steel casement sizes on a 4 in. increment. These proposals indicate a substantial improvement in standardization for the manufacturers of light-weight steel casements. The sizes, however, present some difficulty in fitting into the preferred opening sizes in brick walls. The study committee is preparing a full analysis of this problem as a basis for a joint meeting between this group and the groups working on masonry.

The ***Study Committee on Natural Stones*** is receiving copies of studies prepared on other types of masonry constructions. Any useful application of coordination to the natural stones suggested by these studies will be investigated by this group.

The ASA committee on Coordination of Dimensions of Building Materials includes representatives of more than 40 trade associations, engineering societies, and other organizations connected with the building industry, and is working under the leadership of the American Institute of Architects and the Producers' Council, Inc.

Radioactive Standards in Process For National Bureau of Standards

A SERIES of radioactive standards for use in geology, geophysics, and cosmology, as well as in biological and medical investigations, will be available to investigators as working standards from the National Bureau of Standards. They are now being completed and will then be deposited at the Bureau. The standards are being prepared under the direction of the Committee on Standards of Radioactivity of the National Research Council.[1]

These standards will cover:

1. *Radium Standards:*

(*a*). 100 cc solutions sealed in 200 cc Pyrex flasks containing 10^{-9} and 10^{-11} grams of radium to be used as emanation standards either directly or by subdilution.

(*b*). 5 cc solutions sealed in Pyrex ampoules containing, 0.1, 0.2, 0.5, 1.0, 2.0, 5.0, 10, 20, 50, and 100 micrograms of radium to be used as gamma ray standards. If desired, these may be obtained in sets of 13 with two each of the 0.2, 2, and 20 microgram standards.

2. *Thorium Standards:*

Sealed ampoules containing sublimed $ThCl_4$. These may be used in preparing standard thorium solutions. Directions for use will be furnished with the standard.

3. *Standard Rock Samples:*

The following rocks, ground to pass 40-mesh screen and be retained on 100-mesh screen, are available in 100-gram samples.

These samples of rock will be analyzed for radium and thorium content and are intended for use as working standards to check methods used in extraction of radon and thoron from rock samples. They may be used for direct fusion in the electric furnace or for carbonate fusion.

Quartzite (Virginia)
Triassic diabase (Virginia)
Milford granite (Massachusetts)
Chelmsford granite (Massachusetts)
Gabbro-diorite (Massachusetts)
Columbia River Basalt (Idaho)
Berea sandstone (Ohio)
Dunite (North Carolina)
Carthage granite (Missouri)
Carthage limestone (Missouri)
Deccan Trap (India)
Kimberlite (South Africa)

All the above samples will be analyzed at a number of laboratories equipped to make such measurements and ultimately certificates will be issued by the National Bureau of Standards, it is announced. This work is in progress but will require considerable time for its completion so that final figures are available only for a part of the samples at the present time.

"Accurate knowledge of the radioactive content of the materials of the earth's crust is of primary importance in many phases of geology, geophysics, and cosmology," says the announcement of their work by the members of the Committee published in *Science*, March 22. "Reliable radioactive standards are also essential in studies of radium and thorium poisoning and in biological and medical investigations using the technique of radioactive indicators or internal artificial radioactivity therapy. For the latter purposes calibrated standard sources of Beta-rays will be made available.

"It is hoped that the standards which have been prepared by the committee will provide all workers in these fields with a common basis for comparison of measurements and also improve

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[1]This work is being supported in part by a grant from the American Philosophical Society to the Massachusetts Institute of Technology.

the accuracy of all measurements of this type. It is likely that they will have other applications, and the committee would appreciate hearing from interested persons who may desire similar standards for their work. The committee is also glad to cooperate as far as possible in aiding investigators to use these standards to the best advantage and welcomes specific inquiries regarding their use. It is urged that any suggestions regarding other desirable radioactive standards, not at present available, be submitted promptly to the committee. In particular, it will facilitate the work of the committee if those laboratories and individuals which can make use of these standards advise the committee of their probable requirements."

Professor Robley D. Evans, Department of Physics, Massachusetts Institute of Technology, Cambridge, Massachusetts, is chairman.

Hearing May 2 to Consider Canned Tomatoes Standard

A proposal to amend the standard of identity for canned tomatoes, published in the Federal Register of July 18, 1939, will be considered at a public hearing on May 2. The proposed amendment would permit the use of calcium chloride or other harmless calcium salts as an optional ingredient for the purpose of preventing breakdown of tomato flesh or tissue as the result of processing and shipment. On the basis of evidence received the Department will determine whether the standard should be amended.

The hearing will begin at 10 a. m., in room 3106, Department of Agriculture South Building, Washington, D. C., and will be held under the provisions of the Federal Food, Drug, and Cosmetic Act.

ASA Standards Activities

Approved Standards Available Since Publication of Our March Issue

Specifications for Welded Wrought-Iron Pipe, American Standard B36.2-1939 25¢

Approval Requirements for Domestic Gas Ranges, American Standard Z21.1-1940 $1.00

Approval Requirements for Gas Clothes Dryers, American Standard Z21.5-1940 $1.00

Approval Requirements for Hot Plates and Laundry Stoves, American Standard Z21.9-1940 50¢

Approval Requirements for Gas Space Heaters, American Standard Z21.11-1940 $1.00

Approval Requirements for Central Heating Gas Appliances, American Standard Z21.13-1940 $1.00

Approval Requirements for Gas Unit Heaters, American Standard Z21.16-1940 $1.00

Listing Requirements for Gas Conversion Burners, American Standard Z21.17-1940 50¢

Listing Requirements for Automatic Pilots (formerly Automatic Devices Designed to Prevent Escape of Unburned Gas), American Standard Z21.20-1940 50¢

Listing Requirements for Gas Appliance Thermostats, American Standard Z21.23-1940 50¢

Standards Now Being Considered by Standards Council for ASA Approval

Twist Drills, Straight Shank, Proposed American Standard B5.12

Commercial Standard for Book Cloths, Buckrams, and Impregnated Fabrics for Bookbinding Purposes Except Library Bindings CS 57-36

Proposed American Recommended Practice for the Use of Explosives in Anthracite Mines M27

Commercial Standards for Sun Glass Lenses (CS 78-39; CS 79-39)

Rubber-Insulated Tree Wire (Revision of C8.16-1936) C8.16

Methods of Testing Molded Materials Used for Electrical Insulation (Revision of C59.1-1938; ASTM D 48-39)

Specifications for Soft or Annealed Copper Wire (ASTM B3-39) H4.1

Specifications for Hard-Drawn Copper Wire (Revision of H14-1929; ASTM B1-39) H4.2

Specifications for Medium-Hard-Drawn Copper Wire (ASTM B2-39) H4.3

Tinned Soft or Annealed Copper Wire for Electrical Purposes (ASTM B 33-39) H4.4

Copper Trolley Wire (ASTM B 47-39) H4.6

Hot-Rolled Copper Rods for Electrical Purposes (ASTM B49-39) H4.7

Bronze Trolley Wire (ASTM B 9-39) H22.1

Methods of Testing and Tolerances for Tubular Sleeving and Braids (ASTM D 354-36) L13

Safety Rules for Radio Installations of the National Electrical Safety Code, Part 5

Electric Fences of the National Electrical Safety Code, Part 6

New Projects Being Considered

Standardization of Identification Markings for Compressed Gas Cylinders

Safety Shoes

GAS APPLIANCES

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Safer appliances

Increased consumer acceptance

*** In past 10 years thermal efficiency of gas range top burners has increased 50%—one-half more heat for same amount of gas burned. This sort of improvement has led to greater demand for tested and approved appliances.**

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